CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

PROPOSED STATE STANDARD,
TITLE 8, CHAPTER 4

Amend Sections 1504, 1591, 1597, 3663, and 7016; and add new Appendix A to follow Section 1591 and new Section 4925.1, as follows:

Subchapter 4. Construction Safety Orders

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Article 2. Definitions

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§1504. Definitions.

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Excavation, Trenches, Earthwork.

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(G) Shaft. An excavation under the earth's surface in which the depth, is much greater than its cross-sectional dimensions such as those formed to serve as wells, cesspools, certain foundation footings, and under streets, railroads, buildings, etc.

Exhaust Retrofit. Modifications made to a vehicle’s existing exhaust system to install an air pollution control device, including the air pollution control device and all modified sections of the vehicle’s exhaust pipes.

Exit. Exit is a continuous and unobstructed means of egress to a public way, and shall include intervening doors, doorways, corridors, exterior exit balconies, ramps, stairways, smoke-proof enclosures, horizontal exits, exit passageways, exit courts, and yards.

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NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Article 10. Haulage and Earth Moving

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CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

PROPOSED STATE STANDARD,
TITLE 8, CHAPTER 4

§1591. Haulage Vehicles, Equipment-Construction and Maintenance.

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(m) Exhaust retrofits shall be installed and maintained in accordance with the following:

(1) An exhaust retrofit shall not reduce the capacity, structural integrity, or safe performance of a vehicle.

(2) An exhaust retrofit shall not reduce the operator's ability to access or egress a vehicle safely.

(3) An exhaust retrofit shall be located or effectively shielded such that it does not increase the risk of a fire due to accidental contact with hydraulic fluid or fuel spilled during transfer or sprayed from a broken hose, pipe, or container.

(4) An exhaust retrofit shall be located or effectively shielded such that it does not increase the risk of the operator, during performance of normal duties, contacting exhaust system surfaces having a temperature of 140 degrees F (60 degrees C) or higher.

(5) Before a vehicle equipped with an exhaust retrofit is placed in use, the effect of the retrofit on the operator's visibility shall be evaluated in accordance with the Visibility Testing Procedures (visibility test) in Appendix A of this Section, and the retrofit shall pass the visibility test, in accordance with Section B of Appendix A.

(6) Where subsection (m)(5) requires visibility testing be conducted on a vehicle, the employer shall maintain a written record of the visibility testing. The visibility testing record shall be readily available as long as the employer uses the vehicle. The record shall include the following information:

(A) Type of vehicle, manufacturer, and model number;

(B) Vehicle identification number;

(C) Manufacturer and model of the exhaust retrofit;

(D) If the exhaust stack is modified, diagrams and measurements showing the dimensions and location, with respect to the operator, of the modified exhaust stack and the OEM exhaust stack;

(D) The pass/fail results of the visibility test;

(E) The printed name, signature and contact information of the person conducting the visibility test; and

(F) The test date.

EXCEPTION: The employer is not required to maintain a record of the visibility testing conducted on a vehicle if all sections of the exhaust retrofit are completely inside the Original Equipment Manufacturer (OEM) engine compartment.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Add New Appendix A and New Figures 1 – 11 as follows:

Appendix A to Section 1591

Visibility Testing Procedures (Mandatory)

A. General Requirements.

1. Scope and Application. Where Sections 1591, 1597, 3663, 4925.1, or 7016 require a vehicle equipped with an exhaust retrofit to be evaluated to determine the effect of the retrofit on the operator's visibility, the evaluation shall be conducted in accordance with the Visibility Testing Procedures (visibility test) of this Appendix.

2. Definitions.

a. Exhaust Retrofit. Modifications made to a vehicle's existing exhaust system to install an air pollution control device, including the air pollution control device and all modified sections of the vehicle's exhaust pipes.

b. Masking. Masking is the area where the operator's vision is blocked, as illustrated in Figure 1, where the shaded area to the right of the retrofit represents masking created by the retrofit.

3. All line of sight measurements required by these procedures shall consider the operator's direct view without the use of mirrors or cameras.

B. Test Procedures and Performance Criteria.

1. All sections of an exhaust retrofit shall comply with one or more of the conditions listed in subsections B.3.a through B.3.d. The conditions in subsections B.3.a through B.3.c apply to all sections of a retrofit, including exhaust stacks. The conditions in subsection B.3.d apply only to retrofit exhaust stacks. Any, or all, of the test procedures referenced in subsections B.3.a through B.3.d may be used to evaluate different sections of a single retrofit, noting again that the procedures referenced in subsection B.3.d apply only to retrofit exhaust stacks. All sections of a retrofit shall be evaluated, including all sections of pollution control devices and modified sections of exhaust pipes. In addition, vehicle modifications made as part of the retrofit installation, such as expanding an engine compartment hood or adding a heat shield, shall be evaluated as a part of the retrofit.

2. A retrofit passes the visibility test, if all sections of the retrofit, except the exhaust stack, meet the performance criteria of at least one of the test procedures referenced in subsections B.3.a through B.3.c, and the retrofit exhaust stack meets the performance criteria of at least one of the test procedures referenced in subsections B.3.a through B.3.d.

3. Subsections B.3.a through B.3.d list conditions for passing the visibility test as specified in subsections B.1 and B.2.

a. The retrofit section is inside the Original Equipment Manufacturer (OEM) engine compartment, as determined by the test procedures and criteria in subsection C.1.

b. The retrofit section is out of the operator's sight or is below the operator's line of sight to the edge of the vehicle, as determined by the test procedures and criteria in subsection C.2.

c. The retrofit section does not block the operator's view of the top of a 5 foot high railing positioned around the vehicle directly above a line on the test surface located a distance of

40 inches outside of the smallest rectangle encompassing the perimeter of the vehicle, as determined by the test procedures and criteria in Section D.

d. The retrofit exhaust stack does not create more masking than the OEM exhaust stack, as determined by the test procedures and criteria in Section E.

C. Zero Masking Visibility Test Procedures.

The procedures in Section C may be used to evaluate retrofit components located, with respect to the operator's view, under, behind, or in front of parts of the vehicle to determine that the vehicle, and not the retrofit, blocks the operator's view towards the ground.

1. Retrofit components inside the OEM engine compartment. The procedures and criteria in subsections C.1.a and C.1.b apply when the conditions in subsections B.3.a must be met to comply with the provisions in Section B.

a. Determine the location of the retrofit component with respect to the OEM engine compartment.

b. The retrofit component meets the test criteria for this zero masking visibility test procedure if the component is located inside the boundary of the OEM engine compartment.

2. Retrofit components out of the operator's sight (see Figures 2 and 3) or below the operator's line of sight to the edge of the vehicle (see Figures 4 and 5). The procedures and criteria in subsections C.2.a through C.2.e apply when the conditions in subsections B.3.b must be met to comply with the provisions in Section B.

a. Position the vehicle as instructed in Section F.

b. Position the light source as instructed in Section I.

c. Stand next to the vehicle with the retrofit component between you and the light source. Move forward and backward and adjust your eye height, as necessary, so that your line of sight to the center of the light is in line with the edge of the vehicle surrounding the retrofit component.

d. While adjusting your eye height as needed to maintain the line of sight established in subsection C.2.c., move your eye position laterally so that your line of sight travels along the entire edge of the vehicle surrounding the retrofit component, from one end of the component to the other.

e. The retrofit component meets the test criteria for this zero masking visibility test procedure if it does not block your view of both lights when performing the procedure in subsection C.2.d.

D. Rectangular Boundary Visibility Test Procedures.

The procedures in Section D may be used to evaluate retrofit components that obstruct the operator's view towards the ground to determine whether a retrofit component creates masking 5 feet above a line on the test surface that is a distance of 40 inches outside of the smallest rectangle encompassing the perimeter of the vehicle. The procedures and criteria in subsections D.1 through D.8.c apply when the conditions in subsection B.3.c must be met to comply with the provisions in Section B.

1. Position the vehicle as instructed in Section F.

2. Position the light source as instructed in Section I.

3. Mark a rectangular boundary line on the test surface at a distance of 40 inches outside of the smallest rectangle encompassing the perimeter of the vehicle. It is not necessary to mark

the boundary line around the entire vehicle, provided that the length and location of the marked area is sufficient to allow the measurements required by this Section. For excavators, the front of the track shall be used for determining the boundary line. For other vehicles equipped with buckets or blades, the boundary line shall be determined using the bucket or blade in the traveling position (see Figure 6).

4. Use a straight, rigid material, such as pipe, to construct a stable, self-supporting, horizontal railing 5 feet in height at the top of the railing.

5. Position the railing directly over the rectangular boundary line such that the railing and the retrofit are directly between you and the light source (see Figure 7).

6. Adjust your eye height so that your line of sight to the center of the light source is in line with the top of the railing.

7. While adjusting your eye height as needed to maintain the line of sight established in subsection D.6, move your eye position laterally so that your line of sight travels along the entire length of railing that is above, below, or in line with the retrofit component, from one end of the component to the other (see Figure 8).

8. The retrofit component meets the test criteria for this rectangular boundary visibility test procedure if, when performing the procedure in subsection D.7, all of the following conditions are met:

a. The retrofit component does not block your view of both lights.

b. The retrofit component is not visible above your line of sight.

c. The retrofit component is not above a part of the vehicle blocking your view of both lights.

E. Exhaust Stack Visibility Test Procedures.

The procedures in Section E may be used to evaluate vertical retrofit exhaust stacks to determine whether a vertical retrofit exhaust stack, due to its size and location, creates no more masking than the OEM exhaust stack. The procedures and criteria in subsections E.1 through E.3.c apply when the conditions in subsections B.3.d must be met to comply with the provisions in Section B.

1. Determine the diameter of the retrofit exhaust stack and the OEM exhaust stack.

2. Determine the location of the retrofit exhaust stack and the OEM exhaust stack in relation to the operator’s position.

3. The retrofit exhaust stack meets the test criteria for this exhaust stack visibility test procedure if it meets all of the following conditions:

a. The modification is not larger in diameter than the OEM exhaust pipe.

b. The modification is not closer to the operator than the OEM exhaust pipe.

c. The modification is in the same position as the OEM exhaust pipe in relation to the operator’s 360 degree view towards the horizon.

F. Vehicle Position.

The procedures in subsections F.1 and F.2 shall apply when the conditions in subsections B.3.b or B.3.c must be met to comply with the provisions in Section B.

1. Park the vehicle on an area of compacted earth or paved surface with a gradient of no more than 3% in any direction. The area must be of sufficient size to ensure that the measurements required by the visibility test are conducted on a flat horizontal plane.

2. Turn off the vehicle engine, set the parking brake, and block the tires. Position attachments, such as buckets and blades, in the traveling position and block them in place. Exception: The bucket or blade may be lowered to the ground instead of being blocked in the traveling position, provided that this lowered position does not affect the visibility test results.

G. Seat Reference Point.

The procedures in subsections G.1 through G.6 apply when the conditions in subsections B.3.b or B.3.c must be met to comply with the provisions in Section B. The seat reference point is used to establish the operator's eye position, which is used to perform line of sight measurements to identify masking. The seat reference point shall be located and marked, as follows:

1. If the seat pan has a tilt feature, adjust the seat pan so that it is as level as possible.

2. If the seat can be adjusted forward and backward, adjust the seat so that it is midway between the maximum forward and maximum rearward position.

3. If the seat height can be adjusted, adjust the seat height so that it is midway between the minimum and maximum height.

4. If the compression of the seat cushion is adjustable (air suspension seats), adjust the seat compression so that it is midway between its maximum and minimum range.

5. Use a carpenter's square to locate the seat reference point, as follows (see Figure 9):

a. Rest the edge of one arm of the carpenter's square on the seat cushion such that it is level and bisects the seat from left to right.

b. Position the other arm of the carpenter's square such that it is vertical and its edge touches the most forward part of the seat backrest.

6. Mark a point on the center line of the seat 4½ inches in front of the most forward part of the backrest. This point is the seat reference point.

H. Light Filament Height.

The procedures in subsections H.1 through H.5 apply when the conditions in subsections B.3.b or B.3.c must be met to comply with the provisions in Section B. The light filament height is the vertical distance above the seat reference point that represents the eye level of the average height and weight operator when sitting. For seats with hard seat pans without cushions, the light filament height is 30½ inches, provided that, when sat on, the seat does not sink in elevation (compress) causing the seat reference point to lower. Seats that compress when sat on, such as those with air suspension or seat cushions, cause the average operator's eye level to be lower than 30½ inches above the seat reference point of the unoccupied seat. For seats that compress when sat on, the distance that the operator's seat compresses when an average weight operator sits in it (seat compression) shall be measured and used to determine the light filament height, as follows (see Figure 10):

1. Select a person weighing 165 to 215 pounds to represent the average weight operator. The operator shall sit on a hard bench or similar surface that does not compress when sat on. Measure and record the distance from the seat surface to the top of the operator's head (sitting height).

2. The operator shall sit upright in the operator's seat with the seat adjusted as described in Section G. Measure and record the distance from the top of the operator's head to an overhead reference point directly above. If an overhead reference point, such as the cab ceiling or a roll

bar, is not available, construct and use a portable reference point. Plastic pipe in the shape of a roll bar may be used for this purpose.

3. With the seat unoccupied and adjusted as provided in Section G, measure the distance from the overhead reference point to the seat reference point.

4. Calculate the seat compression as follows (D-1, D-2, and D-3 refer to Figure 10):

Seat compression = sitting height (D-1), plus the distance from the top of the operator's head to the overhead reference point (D-2), minus the distance from the seat reference point (unoccupied) to the overhead reference point (D-3).

5. Calculate the light filament height as follows:

Light filament height = 30½ inches minus the seat compression.

I. Light Source Position.

The procedures in subsections I.1 through I.5 apply when the conditions in subsections B.3.b or B.3.c must be met to comply with the provisions in Section B. The light source position represents the position of the operator's eyes when operating the vehicle. A light spacing of 8 inches is used to simulate the operator's ability to move his or her head and torso, which increases the horizontal range of eye position. Construct and position a light bar and light bar support device as follows (see Figure 11):

1. Construct a light bar by attaching two lights to a bar such that the lights are 8 inches apart and 4 inches from the center of the light bar.

2. The lights shall be of a type and intensity such that the center of the light source can be easily identified in day light at a distance of 40 feet.

3. Construct a light bar support device such that:

a. The light bar is capable of being rotated 360 degrees on a horizontal plane with the axis of rotation centered between the two lights.

b. The light filaments, or centers, shall be ½ to 2 inches in front of the axis of rotation of the light bar.

4. Position the light bar on the operator's seat such that:

a. It is horizontal and rotates on a horizontal plane.

b. Its axis of rotation is directly above the seat reference point.

c. The vertical center of the light sources is positioned at a height equal to the light filament height calculated in subsection H.5.

5. When measuring masking created by a retrofit, rotate the light bar such that the lights point directly towards the retrofit.

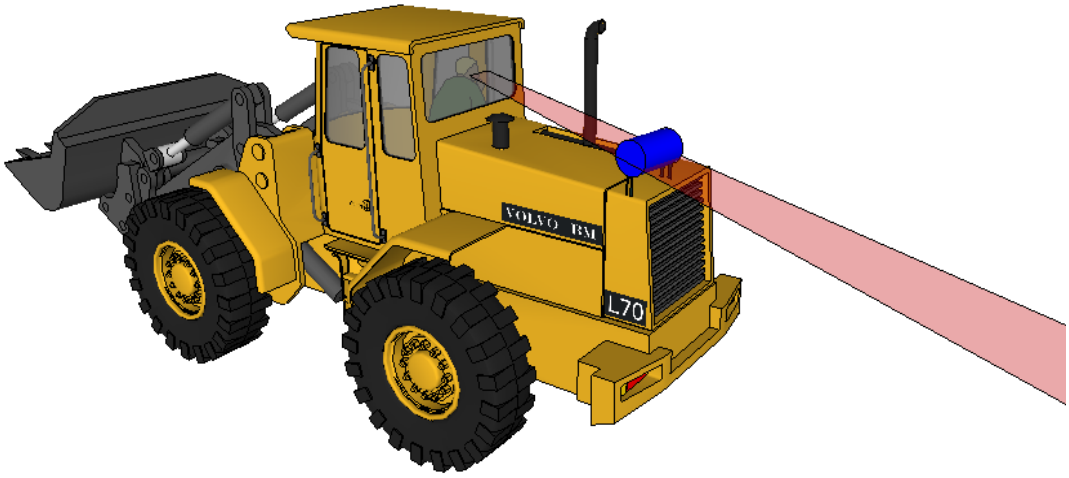

Figure 1

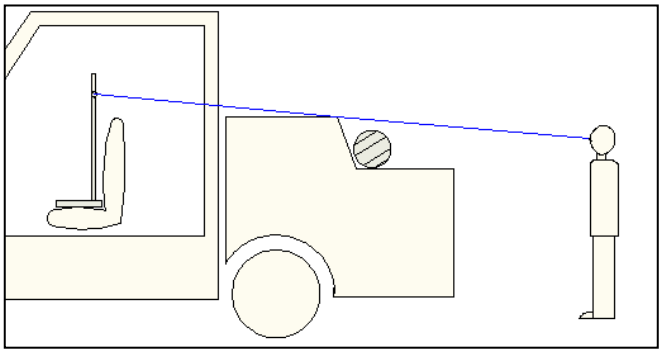

Figure 2

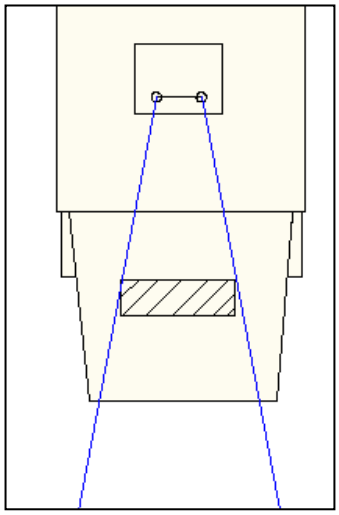

Figure 3

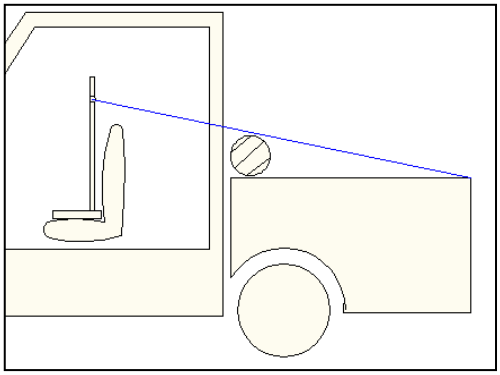

Figure 4

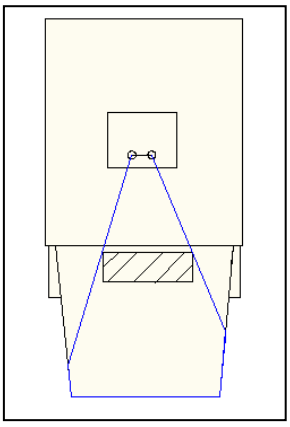

Figure 5

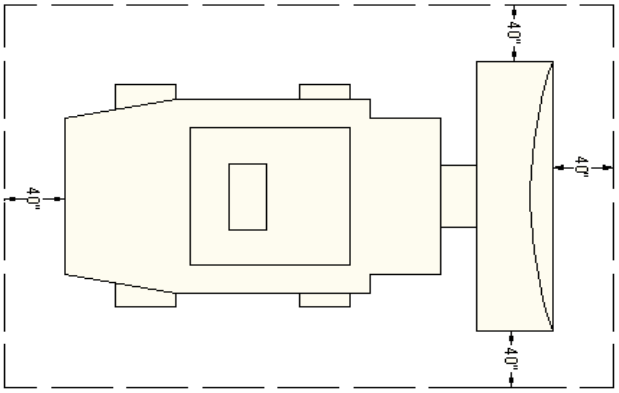

Figure 6

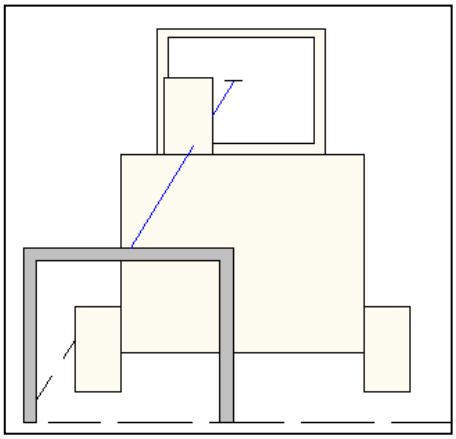

Figure 7

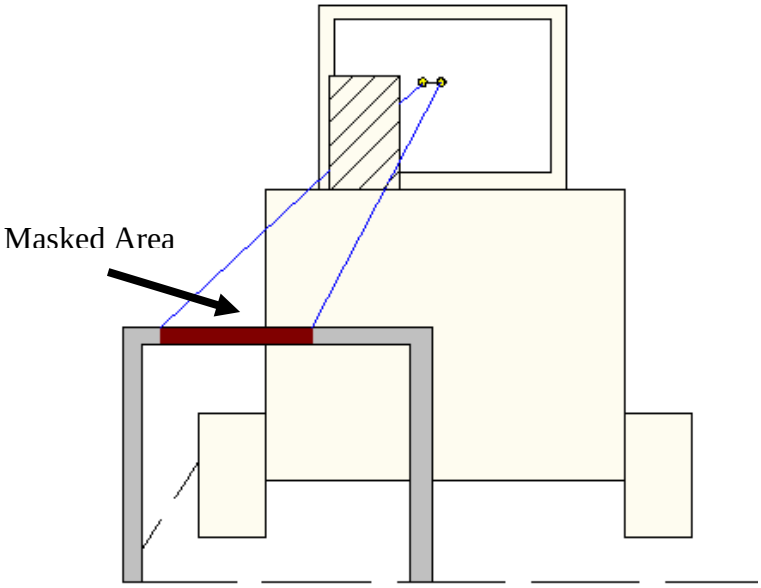

Figure 8

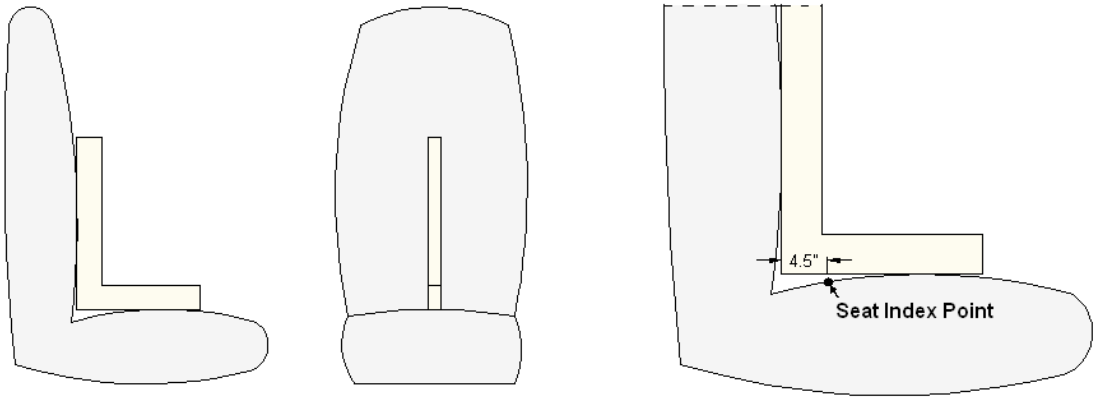

Figure 9

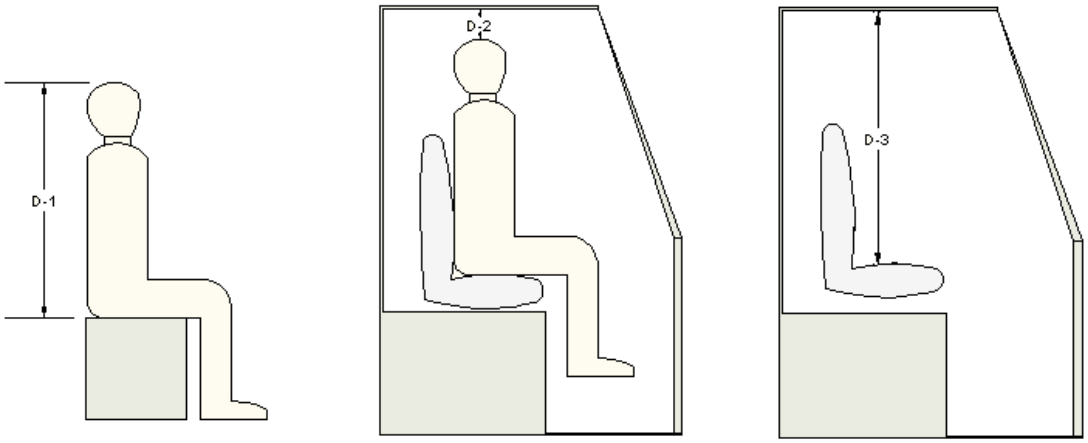

Figure 10

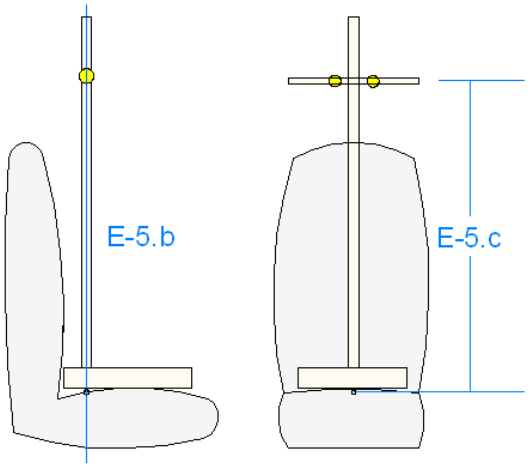

Figure 11

CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

PROPOSED STATE STANDARD,
TITLE 8, CHAPTER 4

Article 11. Vehicles, Traffic Control, Flaggers, Barricades, and Warning Signs

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§1597. Jobsite Vehicles.

Jobsite vehicles as defined in Section 1504 of these Orders, which are utilized on jobsites exclusively and are, therefore, excluded from the provisions of applicable traffic and vehicular codes shall be equipped and operated in the following manner:

* * *

(l) Exhaust retrofits. Modifications made to a jobsite vehicle's existing exhaust system to install an air pollution control device, including the air pollution control device and all modified sections of the vehicle's exhaust pipes, shall comply with Section 1591(m).

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Subchapter 7. General Industry Safety Orders

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Group 4. General Mobile Equipment and Auxiliaries

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Article 25. Industrial Trucks, Tractors, Haulage Vehicles, and Earthmoving Equipment

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§3663. Maintenance of Industrial Trucks.

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(g) Industrial trucks shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the

elimination of any parts, except as provided in subsections (h) and (i) of this Section. Additional counterweighting of fork trucks shall not be done unless approved by the truck manufacturer.

* * *

(i) Exhaust retrofits. Modifications made to an industrial truck's existing exhaust system to install an air pollution control device, including the air pollution control device and all modified sections of the vehicle's exhaust pipes, shall comply with Section 1591(m).

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Group 13. Cranes and Other Hoisting Equipment

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Article 93. Boom-Type Mobile Cranes

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§4925.1. Exhaust Retrofits.

Modifications made to a mobile crane's existing exhaust system to install an air pollution control device, including the air pollution control device and all modified sections of the vehicle's exhaust pipes, shall comply with Section 1591(m).

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

Subchapter 17. Mine Safety Orders

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Article 17. Loading, Hauling, and Dumping

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CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD

PROPOSED STATE STANDARD,
TITLE 8, CHAPTER 4

§7016. Haulage Vehicle, Construction and Maintenance.

* * *

(m) Exhaust retrofits. Modifications made to a vehicle's existing exhaust system to install an air pollution control device, including the air pollution control device and all modified sections of the vehicle's exhaust pipes, shall comply with Section 1591(m).

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.